

The Many Different types of Interference: Knowing is Half the Battle.

Apart from noise, other forms of interference are found in radio receivers such as image frequency, transmitters operating on an adjacent channel and transmitters operating on the same channel. Frequency modulation provides not only improvement in the sound noise ratio but also greater discrimination against all other interfering signals, no matter what their source. As we know the frequency modulation with maximum deviation of around 75 kHz pre-emphasis provides noise rejection of at least 23 db better than amplitude modulation.

Accordingly if an amplitude modulation receiver needs sound noise ratio of 60 db at the detector for excellent performance, then a frequency modulation receiver will provide the same performance for sound noise ratio of only 37 db. These results irrespective of whether the interfering signal is due to noise or adjacent channel signal. The mechanism of frequency modulation limiter of reducing interference is exactly the same whether it is noise or adjacent channel signal. Further each frequency modulation broadcast channel occupies 200 kHz. Out of this, only 180 kHz is actually used while the remaining 20 kHz constitute the guard band which reduces adjacent channel interference further.

The amplitude limiter used in frequency modulation receiver passes the stronger signal but eliminates the weaker one. It is for this reason that noise reduction is obtained in frequency modulation provided that the signal is at least twice the noise peak amplitude. For the same reason, a relative weaker interfering signal from any other transmitter operating in the same frequency as the desired one, will be attenuated. The co-channel interference is suppressed in frequency modulation. The possibility of co-channel interference arises in practice when a mobile receiver travels from one transmitter towards another operating on the same frequency. Interesting phenomena of capture takes place. Thus in frequency modulation, as the mobile receiver moves from one transmitter to second, the second transmitter is virtually inaudible causing practically no interference so long as the signal voltage from the second transmitter is less than about half of the that from first.

Beyond this point the second transmitter become quite audible in the background and eventually predominates thereby excluding the first transmitter. Thus the mobile receiver gets captured by the second transmitter. When the receiver is in the transition region i.e. roughly in the center zone and fading takes place, then signal from the two transmitters are alternatively stronger. Thus the receiver is captured alternatively by one transmitter and then the other. This switching from one transmitter to another is most annoying and does not happen in amplitude modulation system. In amplitude modulation receiver capture effect is not obtainable. In this case as the mobile receiver travels from one transmitter will always predetermine while the other one would be heard as quite significant interference although it may be very difficult.

About the Author

Tymon Hytem has worked in the electronics field for the past 15 years. He enjoys helping people decide on electronic gadgets from telephones to [XM Radio](#) and choosing the perfect XM Satellite Radio system for their needs.

Source: <http://www.gig-events-guide.co.uk>